

2004 North Dakota Abandoned Mine Lands Reclamation Update

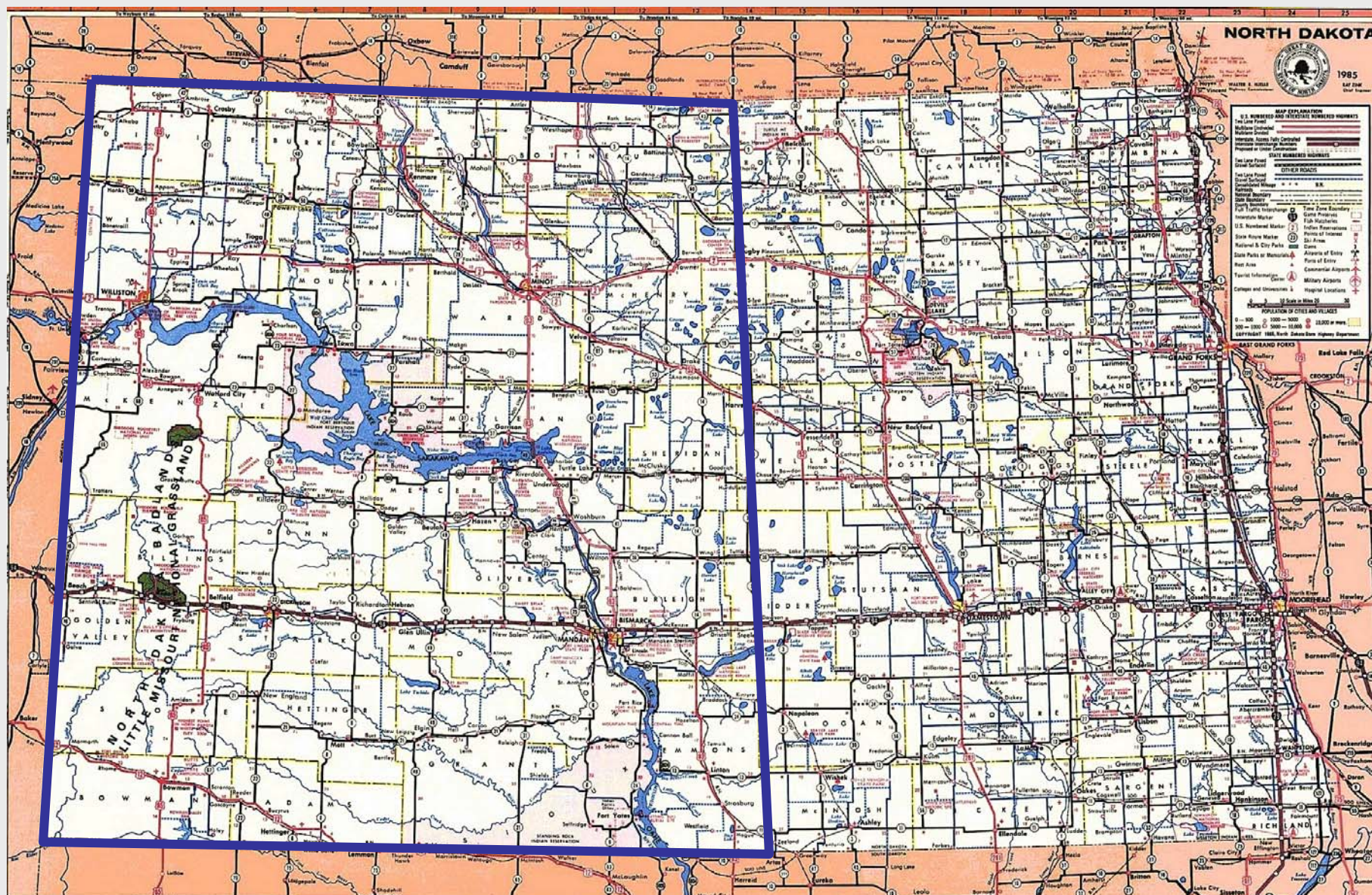


*William E. Dodd
North Dakota Public Service Commission
April 2004*

About the North Dakota Public Service Commission and the Abandoned Mine Lands Division

- ✓ The Board of Railroad Commissioners was established by Dakota Territory in 1885. Its name was changed in 1940 to Public Service Commission (PSC)
- ✓ North Dakota has three Public Service Commissioners, each elected to six-year terms.
- ✓ The PSC has varying degrees of statutory authority over electric and gas utilities, telecommunications companies, energy plants and transmission sitings, railroads, grain elevators, auctioneers, weights and measures, pipeline safety, and coal mine reclamation.
- ✓ The Commission has 40 full-time employees. The staff is divided into support services and five divisions that provide direct regulatory oversight and consumer assistance.
- ✓ The Abandoned Mine Lands (AML) Division administers a federal program to eliminate hazards associated with abandoned coal mines. The AML Division has 4 FTE's.
- ✓ North Dakota's AML Program was authorized in 1981 under the federal Surface Mining Control and Reclamation Act (SMCRA) of 1977.
- ✓ Program funding comes from a ten cent federal production tax on each ton of lignite coal mined in North Dakota. The state may apply for grants for half the production tax, or about \$1.5 million per year. AML fee collections will end in 2004 unless enabling legislation is reauthorized.
- ✓ Since AML Program inception in 1981, over \$28 million have been spent to reclaim 13.6 miles of dangerous surface mine highwalls, 1500 acres of mine subsidence, and a variety of other hazardous abandoned mine features in North Dakota. An estimated \$43 million more are needed to reclaim all remaining AML Sites in North Dakota.

Coal Mining in North Dakota: Coal Production



North Dakota contains the largest deposit of lignite coal in the world, estimated at 350-600 billion tons. Mineable reserves cover about 32,000 square miles in the western half of the state. Approximately 30 million tons of lignite are mined annually in North Dakota.

AML Contracts 2002-2003

North Dakota Public Service Commission

Project No.	Project Name	Type	Locations (cities)	Project Dates	Contractor	Bid Price
AM-435-01	Exploratory Drilling	Drilling	Sawyer	Jan. 14- Feb 12, 2002	Earth Energy & Water Systems	\$49,850.00
AM-436-02	Beulah Fire Emergency	Coal Refuse Fire	Beulah	Jan. 15-16, 2002	Perreault Construction	\$1,527.50
AM-437-02	Garrison Phase I	Grout Injection	Garrison	May 13-June 27, 2002	Thiem Drilling, Inc.	\$138,250.00
AM-438-02	Lehigh Rd Phase VII	Grout Injection	Dickinson	Jul 22-Oct 31, 2002	Thiem Drilling, Inc.	\$235,450.00
AM-439-02	Beulah/Zap Phase VI	Grout Injection	Beulah & Zap	Jun 3- Sept 12, 2002	Earth Energy & Water Systems	\$245,000.00
AM-440-02	Beulah/Zap Phase VI	Material Testing	Beulah & Zap	Jun 3- Sept 12, 2002	Geoserv, Inc.	\$11,829.50
AM-441-02	Garrison Phase I	Material Testing	Garrison	May 13-June 27, 2002	Material Testing Services, LLC	\$5,680.00
AM-442-02	Lehigh Rd Phase VII	Material Testing	Dickinson	Jul 22-Oct 31, 2002	Geoserv, Inc.	\$12,114.65
AM-443-02	Haynes Phase IV	Surface Mine	Haynes	Jun 1-Sept 30, 2002	Wilson Construction, Inc	\$243,365.00
AM-444-02	Lehigh Rd Phase VII	Property Appraisal	Dickinson	May 9-November 30, 2002	Tomac Appraisals	\$2,400.00
AM-446-02	Haynes Maintenance	Maintenance	Haynes	Jul 23-Jul 26, 2002	Martin Construction, Inc	\$9,000.00
AM-448-02	Columbus Abstract	Abstract	Columbus	Nov 20, 2002-Jan 20, 2003	Northwest Abstract & Title, Inc	\$450.00
AM-449-02	Garrison Abstract	Abstract	Garrison	Nov 20, 2002-Jan 17, 2003	McLean County Abstract, Inc.	\$2,000.00
AM-450-02	Dickinson Title	Title Memorandum	Dickinson	Nov 20-Dec 6, 2002	Dickinson Title Co.	\$150.00
AM-451-02	Haynes Maintenance	Tree Planting	Haynes	Nov 20, 2002-Jun 30, 2003	Adams Co. Soil Cons. Dist.	\$10,005.20
AM-452-02	2002 Maintenance	Sinkhole Filling	Various	Oct 30-Nov 26, 2002	Onsite Improvements, Inc	\$33,250.00
AM-453-03	Noonan Maintenance	Tree Planting	Noonan	Nov 26, 2002	Divide Co. Soil Cons. Dist.	\$2,202.30
						\$1,002,524.15
AM-454-03	Beulah/Zap Phase VII	Grout Injection	Beulah & Zap	May 19-Aug 27, 2003	Thiem Drilling, Inc.	\$268,700.00
AM-455-03	Beulah/Zap Phase VII	Material Testing	Beulah & Zap	May 19-Aug 27, 2003	Geoserv, Inc.	\$14,490.00
AM-456-03	Buechler/Garrison	Grout Injection	Sawyer & Garrison	Aug 18- Oct 18, 2003	Thiem Drilling, Inc.	\$195,900.00
AM-457-03	Buechler/Garrison	Material Testing	Sawyer & Garrison	Aug 18- Oct 18, 2003	Material Testing Services, LLC	\$7,150.00
AM-458-03	Columbus Phase V	Surface Mine	Columbus	Jun 2-Sept 29, 2003	Quality Construction, Inc.	\$177,400.50
AM-459-03	Lehigh Rd Phase VIII	Grout Injection	Dickinson	May 22-Sept 9, 2003	Thiem Drilling, Inc.	\$211,250.00
AM-460-03	Lehigh Rd Phase VIII	Material Testing	Dickinson	May 22-Sept 9, 2003	Geoserv, Inc.	\$9,300.00
AM-461-03	Appraisals	Property Appraisals	Garrison & Columbus	May 7-Nov 30, 2003	Weishaar Appraisal Services	\$23,500.00
AM-462-03	Haynes Maintenance	Fencing	Haynes	Apr 23-Jun 30, 2003	North Estate Fencing	\$16,296.00
AM-463-03	Beulah Maintenance	Drillhole Backfilling	Beulah	Apr 14-Jun 30, 2003	Concrete Services, Inc.	\$770.00
AM-464-03	Buechler Maintenance	Sinkhole Filling	Sawyer	May 19-21, 2003	Quality Construction, Inc.	\$1,344.60
AM-471-03	Belfield Abstract	Abstract	Belfield-Stark	Oct 24-Nov 24, 2003	Queen City Abstract..., Inc.	\$60.00
AM-472-03	Belfield Abstract	Abstract	Belfield-Billings	Oct 24-Nov 24, 2003	Billings County Abstract Co.	\$250.00
AM-473-03	McKenzie Co. Coal Fires	Coal Outcrop Fires	Watford City	Nov 3- Dec 17, 2003	Hanson's Excavating, Inc.	\$29,251.25
AM-474-03	2003 Maintenance	Sinkhole Filling	Various	Oct 27-Dec 10, 2003	Basaraba's Excavating..., LLC	\$20,029.00
AM-477-03	Cartwright Maintenance	Sinkhole Barrier	Cartwright	Nov 17-21, 2003	Franz Construction, Inc.	\$7,500.00
						\$983,191.35

2002 Exploratory Drilling Project



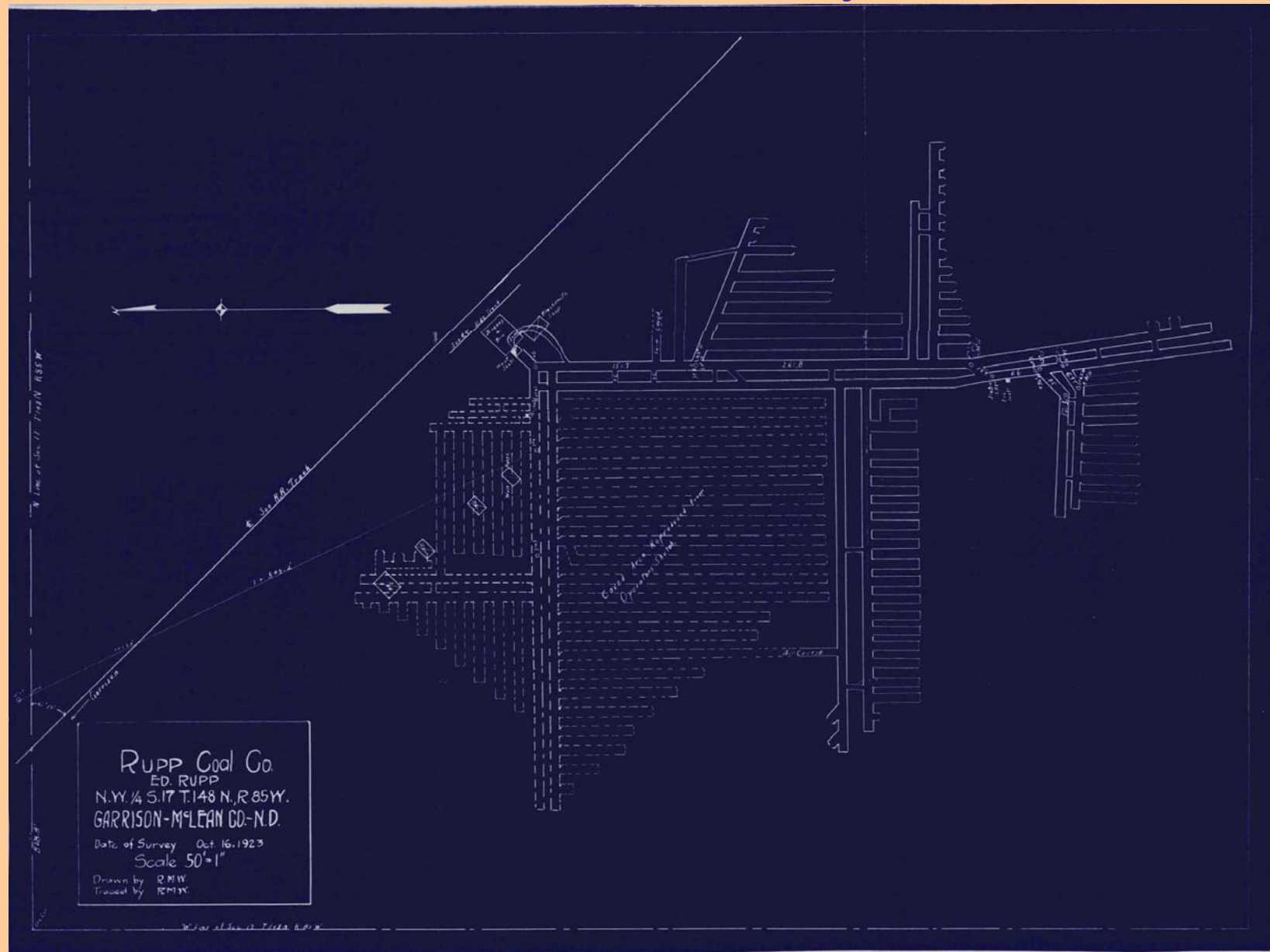
Exploratory Drilling was conducted in January and February 2002 along ND Highway 23 near Sawyer. 57 of 272 holes intercepted underground mined workings and were cased with PVC pipe which can be used as a conduit for grout injection.

2002 Beulah Coal Fire Emergency Project



A dangerous coal refuse fire was extinguished in Beulah, ND, in January 2002. Burning materials were excavated, mixed with clay and buried in pits.

2002 Garrison Phase I Project



The Rupp Mine and several other underground coal mines underlie two highways and residential areas at Garrison, ND. On April 12, 2001, a large sinkhole resulting from mine collapse appeared suddenly on the shoulder of McLean Highway 15 near Garrison.

2002 Garrison Phase I Project



Drilling in two Garrison residential areas intercepted underground mined workings. There are no mine maps for these workings.

2002 Garrison Phase I Project



Pressurized grout remote backfilling was conducted along ND Highway 37 and McLean County Highway 15 near Garrison. 1055 cubic yards (130 truckloads) of grout were injected to stabilize collapsing underground mined workings.

2002 Beulah/Zap Phase VI Project



Rotary drilling and grout injection were conducted to stabilize collapsing underground mined workings along US Highway 200 north of Beulah, ND. Approximately 14,000 feet were drilled and 3800 cubic yards of grout injected in this project phase.

2002 Beulah/Zap Phase VI Material Testing



Grout was tested by a material testing firm at 50 cubic yard intervals for slump, temperature, unit weight, yield and compressive strength. Grout samples must achieve an unconfined compressive strength of 150 PSI within 28 days.

2002 Lehigh Road Phase VII Project



This deep mine collapse feature was located near Lehigh Road about 2 miles east of Dickinson, ND. Note the mobile mixer (grout) truck on the road surface.

2002 Lehigh Road Phase VII Project



Rotary drilling, casing, and pressurized grout injection were conducted along a paved county highway, a rural home and a commercial/industrial site. About 9000 feet were drilled and 4632 cubic yards of grout were injected during this project phase.

2002 Haynes Phase IV Project



A dangerous surface mine highwall and several deep underground mine collapse features (sinkholes) were eliminated near the intersection of two highways in southwestern North Dakota.

2002 Maintenance (Sinkhole Filling) Project



Sinkhole filling projects have been conducted annually in North Dakota for the past decade. In this project, about 100 dangerous sinkholes were eliminated at 12 sites at a cost of \$35,428.50.

2003 Buechler/Garrison Project (Buechler Site)



This project was conducted at sites in Ward and McLean Counties. Approximately 2283 cubic yards (285 truckloads) of grout were injected into collapsing mined workings beneath ND Highway 23 near Sawyer.

2003 Buechler/Garrison Project (Garrison Site)



Additional exploratory drilling and geophysical investigations were conducted within two residential areas and a county highway at Garrison. This indicated the presence of underground mined workings. A third project phase is planned for Garrison in 2004.

2003 Buechler/Garrison Project (Garrison Site)



Marino Engineering Associates, Inc., conducted a cross-hole radar survey to characterize abandoned mined workings at the Garrison Sites. 60 ray paths were measured between 44 boreholes at two residential areas in Garrison.

2003 Beulah/Zap Phase VII Project



This project phase was conducted to stabilize collapsing mined workings beneath US Highway 200 and beneath portions of a mobile home park in Beulah, ND. Drilling conducted along Mercer County Highway 13 south of Zap, ND, revealed that it is also undermined.

2003 Lehigh Road Phase VIII Project



A house mover caused a few headaches for the contractor at this site. This was the final project phase for Lehigh Road. During the eight phases (years) of this project, over 2000 holes were drilled and 40,000 cubic yards of grout injected at a cost of \$2.2 million.

2003 Columbus Phase V Project



Steep unstable surface mine highwalls and water-filled pits were eliminated during this project in northwestern North Dakota. Previous project phases reclaimed portions of this 1280-acre mine located within 100' of ND Highway 40. A sixth Columbus Project phase is planned for 2004.

Evaluating Reclamation Success



In 1998 and 2003, evaluations of the success of reclamation were made at three representative reclaimed surface mined sites. Sampling was conducted to evaluate soil materials, wetland and stockpond water quality and vegetative species composition, cover and forage production.

2003 Maintenance (Sinkhole Filling) Project



Approximately 150 dangerous sinkholes at eight sites were filled in November and December 2003. This site is near the historic Satterlund Black Diamond Mine, one of the earliest commercial mines in the state, located near Washburn about 40 miles northwest of Bismarck.

2003 Maintenance (Sinkhole Filling) Project



This is a picture of the Satterlund Black Diamond Mine circa 1895

2003 Maintenance (Sinkhole Filling) Project



Abandoned mine reclamation is dangerous. This Cat 330 Excavator slid into a sinkhole and tipped over. Luckily no one was injured and the machine only sustained minor damage.

2003 Maintenance (Cartwright Site) Project



This dangerous mine opening near Cartwright, ND, was barricaded in November 2003. It is located near the Fairview Lift Bridge and Cartwright Tunnel Historic Sites and Sundheim Park on the Yellowstone River, about three miles east of the Montana Border.

2003 Maintenance (Cartwright Site) Project



The 1320' Fairview Lift Bridge and 1460' Cartwright Tunnel were constructed in 1912-13. Until 1956, the bridge was used both for rail and vehicular traffic. The last train crossed this bridge in 1986. It was listed on the National Registry of Historic Places in 1997.

2003 Coal Outcrop Fire Suppression Project



Eight of about 30 coal seam fires were extinguished on US Forest Service Lands in the North Dakota Badlands, November and December 2003. Additional fire suppression is planned for 2004.

Major AML Projects Planned for 2004
North Dakota Public Service Commission
March 2004

<u>Project Name</u>	<u>Location(s)</u>	<u>Type</u>	<u>Objective</u>
2004 Beulah/Zap Phase VIII	Zap	Grout Injection	Stabilization of Mercer Co. Highway 13 - 3500 CY
2004 Snake Road	Burlington	Grout Injection	Stabilization of Ward Co. Highway 10A - 2250 CY
2004 Garrison Phase III	Garrison	Grout Injection	Stabilization of two residential areas and McLean Co. Highway 15 - 1500 CY
2004 Belfield	9 mi N of Belfield	Surface Mine	Reclamation of 15-acre uraniferous coal mine - 57,000 CY
2004 Columbus Phase VI	Columbus	Surface Mine	Reclamation of portions of 1280-acre coal mine - 95,000 CY
2004 Maintenance	Various	Sinkhole Filling	Elimination of hazardous mine collapse features (sinkholes)
2004 Coal Outcrop Fire	McKenzie Co.	Fire Suppression	Extinguishment of coal seam fires in ND Badlands

2004 Beulah Emergency Project



This sinkhole appeared on March 24, 2004, in the yard of Curt Michaelson of rural Beulah. It was repaired along with seven other dangerous sinkholes in an emergency reclamation project